Jet Propulsion Laboratory **Interoffice Memorandum**

4 October 1996

To: Sam Dallas
From: Daren Casey
Subject: MGS Guided Nominal Trajectory - 06-Nov-96, 93° Azimuth

Introduction

McDonnell Douglas Aerospace has provided a "guided nominal" trajectory for the Mars Global Surveyor (MGS) launch at the opening of the launch period. This trajectory product differs from the previous Development Test Objectives[1] (DTO) trajectories in that the effects of the vehicle guidance system are included in the simulation. The integer second launch time is not simulated, but will be for the final "Best Estimated Trajectory" or BET product.

Resulting MGS mission parameters differ from earlier DTO results, but the launch vehicle still provides adequate performance.

Injection Targets

The DTO trajectories had no errors at the Targeting Interface Point. Guided nominal errors are shown below. The RLA error is roughly 10% of that caused by an early COLA launch.

Parameter	Error
C_3	-0.0002 km^2/s^2
DLA	0.0049 deg
RLA	0.0148 deg

Mars B-Plane

Errors at Mars encounter are shown below, along with expected 1σ injection errors[2].

Trajectory	ΔB•T (km)	ΔB•R (km)	ΔTime (day)
DTO	-585	66	0.007
Guided Nominal	9798	556	0.2
1σ Injection	405,604	42,607	5.56

Sun Angle Constraints, DSN Initial Acquisition

There are no noticeable changes in sun or DSN geometries.

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[1] "Detailed Test Objectives Trajectories for the Mars Global Surveyor Spacecraft Mission", MDA Memorandum A3-L230-M-96-093, 5 July 1996

[2] "Mars Global Surveyor Navigation Plan", JPL D-12002, Final Rev. B, August 1996